

**Site Investigation**  
**Final**  
**Site-Specific Field Sampling Plan Attachment**  
**for Former Smoke Area**  
**South Slope of Morgan Mountain, Parcel 159(7)**  
**Fort McClellan**  
**Calhoun County, Alabama**

**Prepared for:**

**U.S. Army Corps of Engineers, Mobile District**  
**109 St. Joseph Street,**  
**Mobile, Alabama 36602**

**Prepared by:**

**IT Corporation**  
**312 Directors Drive**  
**Knoxville, Tennessee 37923**

**Delivery Order CK005**  
**Contract No. DACA21-96-D-0018**  
**IT Project No. 774645**

**October 1998**

**Revision 1**

# Table of Contents

---

	<i>Page</i>
List of Tables .....	iii
List of Figures .....	iii
List of Acronyms.....	iv
Executive Summary .....	ES-1
1.0 Project Description .....	1-1
1.1 Introduction .....	1-1
1.2 Site Description .....	1-1
1.3 Scope of Work.....	1-2
2.0 Summary of Existing Environmental Studies .....	2-1
3.0 Site-Specific Data Quality Objectives .....	3-1
3.1 Overview .....	3-1
3.2 Data Users and Available Data.....	3-1
3.3 Conceptual Site Exposure Model .....	3-2
3.4 Decision-Making Process, Data Uses, and Needs .....	3-3
3.4.1 Risk Evaluation .....	3-3
3.4.2 Data Types and Quality .....	3-4
3.4.3 Precision, Accuracy, and Completeness .....	3-4
4.0 Field Activities .....	4-1
4.1 Utility Clearances .....	4-1
4.2 Environmental Sampling .....	4-1
4.2.1 Surface Soil Sampling .....	4-1
4.2.1.1 Sample Locations and Rationale .....	4-1
4.2.1.2 Sample Collection Procedures.....	4-1
4.2.2 Subsurface Soil Sampling.....	4-2
4.2.2.1 Sample Locations and Rationale .....	4-2
4.2.2.2 Sample Collection Procedures.....	4-2
4.2.3 Depositional Soil Sampling.....	4-3
4.2.3.1 Sample Locations and Rationale .....	4-3
4.2.3.2 Sample Collection Procedures.....	4-3
4.3 Decontamination Requirements .....	4-3
4.4 Surveying of Sample Locations.....	4-3
4.5 Analytical Program.....	4-4
4.6 Sample Preservation, Packaging, and Shipping .....	4-4
4.7 Investigation-Derived Waste Management .....	4-5
4.8 Site-Specific Safety and Health .....	4-5

**Table of Contents** (Continued)\_\_\_\_\_

	<b>Page</b>
5.0 Project Schedule .....	5-1
6.0 References .....	6-1

## **List of Tables**

---

<b>Number</b>	<b>Title</b>	<b>Follows Page</b>
3-1	Summary of Data Quality Objectives	3-1
4-1	Site Sampling Rationale	4-1
4-2	Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities	4-1
4-3	Analytical Samples	4-4

## **List of Figures**

---

<b>Number</b>	<b>Title</b>	<b>Follows Page</b>
1-1	Site Location Map, Former Smoke Area, South Slope of Morgan Mountain	1-1
1-2	Site Map, Former Smoke Area, South Slope of Morgan Mountain	1-1
3-1	Human Health Conceptual Site Exposure Model for Former Smoke Area, South Slope Morgan Mountain, Parcel 159(7)	3-3
4-1	Proposed Sampling Locations, Former Smoke Area, South Slope of Morgan Mountain	4-2

## ***List of Acronyms***

---

ADEM	Alabama Department of Environmental Management
CERFA	Community Environmental Response Facilitation Act
CESAS	Corps of Engineers South Atlantic Savannah
CLP	Contract Laboratory Program
COC	chain of custody
CSEM	conceptual site exposure model
DOD	U.S. Department of Defense
DQO	data quality objective
EBS	environmental baseline survey
EPA	U.S. Environmental Protection Agency
ESE	Environmental Sciences and Engineering, Inc.
FTMC	Fort McClellan
GPS	Global Positioning System
IDW	investigation-derived waste
IT	IT Corporation
NAD83	1983 North American Datum
NGVD	National Geodetic Vertical Datum
PID	photoionization detector
PSSC	potential site-specific chemicals
QA/QC	quality assurance/quality control
QAP	installation-wide quality assurance plan
SAP	installation-wide sampling and analysis plan
SFSP	site-specific field sampling plan
SHP	installation-wide safety and health plan
SSHHP	site-specific safety and health plan
SI	site investigation
USACE	U.S. Army Corps of Engineers
WP	installation-wide work plan

## ***Executive Summary***

---

This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT Corporation [IT], 1998a) for Former Smoke Area, South Slope of Morgan Mountain at Fort McClellan, Calhoun County, Alabama, will be used in conjunction with the site-specific safety and health plan (SSHP), installation-wide work plan (WP) (IT, 1998b), habitat-specific screening ecological risk assessment work plan, and the SAP. The SAP includes the installation-wide safety and health plan, waste management plan, and installation-wide quality assurance plan. Site-specific hazard analyses are included in the SSHP.

Former Smoke Area, South Slope of Morgan Mountain, is now an inactive training area that was equipped with smoke-generating equipment. The dates of use could not be determined. A site investigation is being conducted to determine the presence or absence of potential contaminants.

Specifically, IT will collect four surface soil samples, four subsurface soil samples, and one depositional soil sample at the site. Potential contaminant sources include petroleum products (e.g., gasoline, diesel, heating oil, waste oil, and lubricants), solvents, and metals. Chemical analyses of the samples collected during the field program will include volatile organic compounds, semivolatile organic compounds, and metals. Results will be compared with site-specific screening levels specified in the WP and regulatory agency guidelines.

# **1.0 Project Description**

---

## **1.1 Introduction**

The U.S. Army is conducting studies of the environmental impact of suspected contaminants at Fort McClellan (FTMC) in Anniston, Alabama, under the management of the U.S. Army Corps of Engineers (USACE)-Mobile District. The USACE has contracted IT Corporation (IT) to provide environmental services for the site investigation (SI) of the Former Smoke Area, South Slope of Morgan Mountain, under Delivery Order CK005, Contract No. DACA21-96-D-0018.

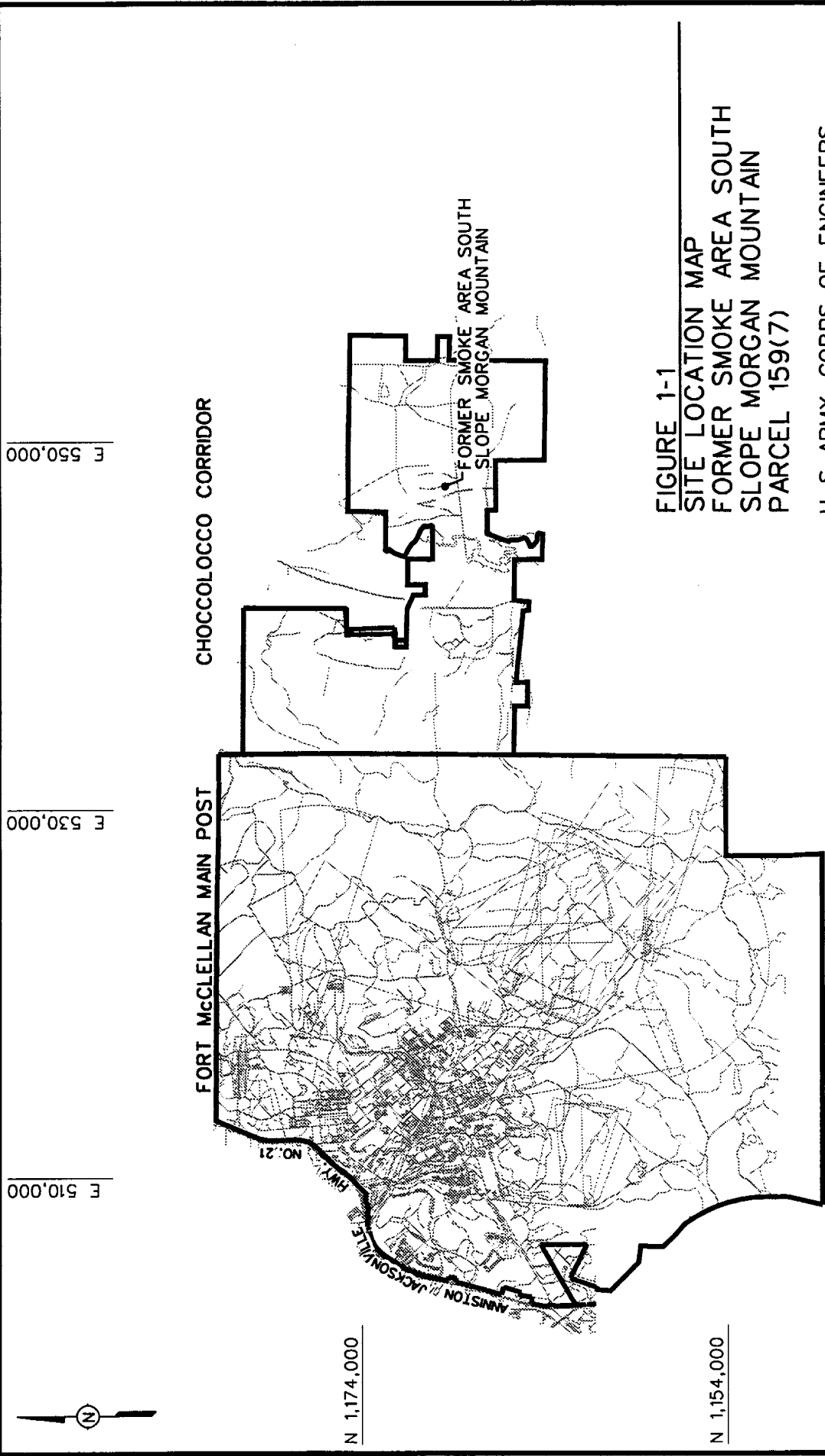
This site-specific field sampling plan (SFSP) attachment to the installation-wide sampling and analysis plan (SAP) (IT Corporation [IT], 1998a) for FTMC, Calhoun County, Alabama has been prepared to provide technical guidance and rationale for sample collection and analysis at the Former Smoke Area, South Slope of Morgan Mountain (Figure 1-1). The SFSP will be used in conjunction with the site-specific safety and health plan (SSHP) developed for the Former Smoke Area, South Slope of Morgan Mountain site, the installation-wide work plan (WP) (IT, 1998b), the habitat-specific screening ecological risk assessment work plan, and SAP. The SAP includes the installation-wide safety and health plan (SHP), waste management plan, and installation-wide quality assurance plan (QAP).

## **1.2 Site Description**

The Former Smoke Area, South Slope of Morgan Mountain is located in the eastern portion of the Choccolocco Corridor at the south toe of Morgan Mountain (Figure 1-1). The study area covers approximately 5 acres. The site and the area around the site is mostly undeveloped or wooded. There is one small stream (Willis Branch) approximately 0.3 miles due south of the site that drains west into Choccolocco Creek. The site is located at the toe of a steep south-facing slope, and is approximately 300 feet wide (east to west) and 600 feet in length (north to south). Shallow groundwater at the site is probably controlled by surface drainage and/or topography. Site elevation is approximately 700 to 760 feet above sea level as established by the National Geodetic Vertical Datum (NGVD). Figure 1-2 is a site map that shows topographic features and site boundaries.

The soil type at the Former Smoke Area, South Slope of Morgan Mountain is the Dewey Series, consisting of strongly acid residuum of limestone or old valley-fill material. The present vegetation is pine, oak, and hickory forest. The soils at this site are formed by erosional forces and surface runoff, and are typically dark red or reddish-brown. The depth to bedrock or groundwater is highly variable and depends on the locale, slope, or presence of fractures.

db:itg	23 OCT 98	STARTING DATE: 05/28/98	DATE LAST REV: 23 OCT 98	DRAFT CHECK BY:	INITIATOR: T. NOLEN	DWG. NO.: \774645es.077
c:\it\ds\civ\774645es.077	09:25:12	DRAWN BY: D. BILLINGSLEY	db:itg	ENGR. CHECK BY: A. MAYILA	PROJ. MGR.: J. YACOB	PROJ. NO.: 774645



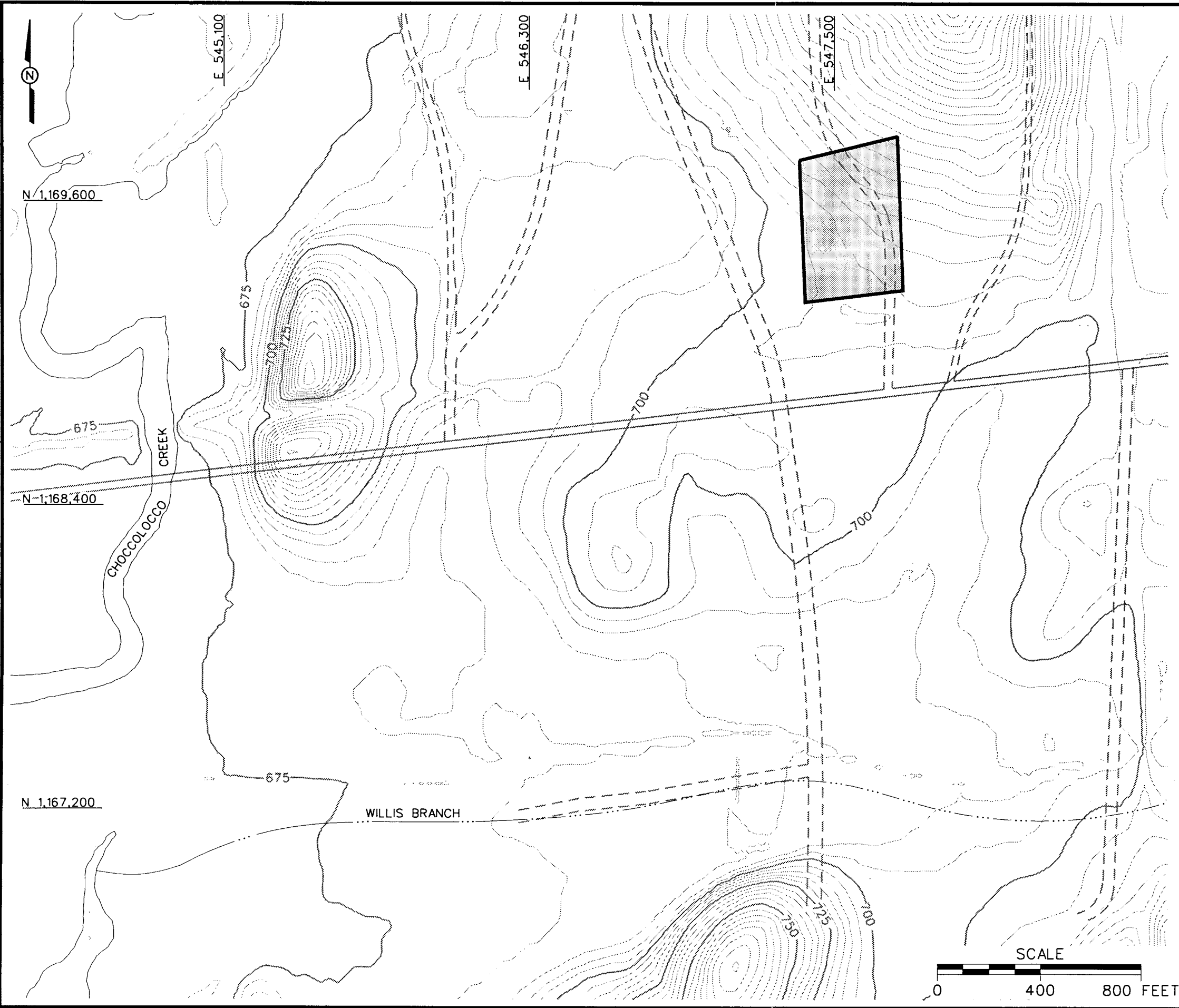
**FIGURE 1-1**  
**SITE LOCATION MAP**  
**FORMER SMOKE AREA SOUTH**  
**SLOPE MORGAN MOUNTAIN**  
**PARCEL 159(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT MCCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**LEGEND:**  
 **CHOCOLOCCO CORRIDOR**  
**BOUNDARY**



dbiling c:\t\ds\civil\view\774645es.078 23 OCT 98 09:26:23 STARTNG DATE: 05/29/98 DATE LAST h DRAFT, CHCK. BY: INITIATOR: T. NOLEN DWG. NO.: 4645es.078  
DRAWN BY: D. BILLINGSLEY ENGR. CHCK. BY: A. MAYILA PROJ. MGR.: J. YACOBUB PROJ. NO.: 774645



- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - SURFACE DRAINAGE / CREEK

**FIGURE 1-2**  
**SITE MAP**  
**FORMER SMOKE AREA SOUTH**  
**SLOPE MORGAN MOUNTAIN**  
**PARCEL 159(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018



Although the permeability is moderate, the capacity for available moisture is high, and the root zone is thick, runoff and erosion is still a hazard. The necessity for permanent vegetation for the control of erosion makes this soil unsuited for cultivation (U.S. Department of Agriculture, 1961).

### **1.3 Scope of Work**

The scope of work for activities associated with the SI at the Former Smoke Area, South Slope of Morgan Mountain as specified in the statement of work (USACE, 1998) includes the following tasks:

- Develop the SFSP attachment.
- Develop the SSHP attachment.
- Collect four surface soil samples, four subsurface soil samples, and one depositional soil sample to determine whether potential site-specific chemicals (PSSC) are present at the Former Smoke Area, South Slope of Morgan Mountain and to provide data to determine future planned corrective measures and closure activities.

Upon completion of the field activities and sample analyses, draft and final summary reports will be prepared in accordance with current U.S. Environmental Protection Agency (EPA) Region IV and the Alabama Department of Environmental Management (ADEM) requirements.

## ***2.0 Summary of Existing Environmental Studies***

---

Environmental Science and Engineering, Inc. (ESE) conducted an environmental baseline survey (EBS) to document current environmental conditions of all FTMC property (ESE, 1998). The study identified sites that, based on available information, have no history of contamination and comply with U.S. Department of Defense (DOD) guidance on fast track cleanup at closing installations. The EBS also provides a baseline picture of FTMC properties by identifying and categorizing the properties by seven criteria.

1. Areas where no storage, release or disposal (including migration) has occurred.
2. Areas where only storage has occurred.
3. Areas of contamination below action levels.
4. Areas where all necessary remedial actions have been taken.
5. Areas of known contamination with removal and/or remedial action underway.
6. Areas of known contamination where required response actions have not been taken.
7. Areas that are not evaluated or require further evaluation.

The EBS was conducted in accordance with the Community Environmental Response Facilitation Act (CERFA) (CERFA-Public Law 102-426) protocols and DOD policy regarding contamination assessment. Record searches and reviews were performed on all reasonably available documents from FTMC, ADEM, EPA Region IV, and Calhoun County, as well as a database search of Comprehensive Environmental Response, Compensation, and Liability Act-regulated substances, petroleum products, and Resource Conservation and Recovery Act-regulated facilities. Available historic maps and aerial photographs were reviewed to document historic land uses. Personal and telephone interviews of past and present FTMC employees and military personnel were conducted. In addition, visual site inspections were conducted to verify conditions of specific property parcels.

The Smoke Area, South Slope of Morgan Mountain consists of one site only. The site was identified as a CERFA site, where petroleum products were stored, released, or disposed, and/or migration of hazardous substances is suspected, but the sites are either not evaluated, or require additional evaluation to determine the environmental condition of the site.

The Former Smoke Area, South Slope of Morgan Mountain is located in the eastern portion of the Choccolocco Corridor at the south toe of Morgan Mountain. Training at the site included the use of smoke generators. The dates of the site's use could not be determined and other information regarding the operation of this site is not available. Surface soil and subsurface soil are the areas of potential contamination within the site boundary.

There have not been any other investigations identified for the Former Smoke Area, South Slope of Morgan Mountain. The site is classified as a Category 7 CERFA site: areas that are not evaluated or require further evaluation.

The Former Smoke Area, South Slope of Morgan Mountain site lacks adequate documentation and therefore requires evaluation to determine the environmental condition of the parcel.

## ***3.0 Site-Specific Data Quality Objectives***

---

### ***3.1 Overview***

The data quality objectives (DQO) process is followed to evaluate data requirements and to support the decision-making process associated with the action selection for the Former Smoke Area, South Slope of Morgan Mountain. This section incorporates the components of the DQO process described in the 1993 EPA publication EPA 540-R-93-071 *Data Quality Objectives for Superfund* (EPA, 1993). The DQO process as applied to the Former Smoke Area, South Slope of Morgan Mountain, is described in more detail in Sections 3.2 and 4.3 of the WP. Table 3-1 provides a summary of the factors used to determine the appropriate quantity of samples, and procedures to meet the objectives of the SI, and to establish a basis for future action at this site.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Chapter 4.0 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with Corps of Engineers South Atlantic Savannah (CESAS) Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using Contract Laboratory Program (CLP)-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

### ***3.2 Data Users and Available Data***

The intended data users and available data related to the SI at the Former Smoke Area, South Slope of Morgan Mountain are presented in Table 3-1 and have been used to formulate a site-specific conceptual model. This conceptual model was developed to support the development of this SFSP, which is necessary to meet the objectives of these activities and to establish a basis for future action at the site. The data users for information generated during field activities are primarily the EPA, USACE, ADEM, FTMC, and the USACE supporting contractors. This SFSP, along with the necessary companion documents, has been designed to provide the regulatory agencies with sufficient detail to reach a determination as to the adequacy of the scope of work. The program has also been designed to provide defensible information required to confirm or deny the existence and nature of residual chemical contamination in site media.

Table 3-1

**Summary of Data Quality Objectives**  
**Former Smoke Area, South Slope of Morgan Mountain, Parcel 159(7)**  
**Fort McClellan, Calhoun County, Alabama**

Potential Data Users	Available Data	Conceptual Site Model	Media of Concern	Data Uses and Objectives	Data Types	Analytical Level	Data Quantity
EPA ADEM USACE DOD IT Corporation Other Contractors Possible future land users	None	<u>Contaminant Source</u> Fuels and fuel components Waste oils, Metals	Surface Soils	SI to confirm or deny the presence of contaminants in the site media and locate source areas, if present.	<u>Surface Soil</u> TCL-VOCs TCL-SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	4 direct-push + QC
		<u>Migration Pathways</u> Infiltration to subsurface soil Dust emissions and volatilization. Uptake by venison.	Subsurface Soils				
		<u>Potential Receptors</u> Groundskeeper (future) Construction worker (future) Resident (future) Recreational site user (current and future) Venison consumption (current and future)	Depositional Soils		<u>Subsurface Soil</u> TCL-VOCs TCL-SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	4 direct-push + QC
		<u>PSSC</u> Fuels Fuel components Waste oils Organics Metals		Obtain sufficient data to support as appropriate the following:  <ul style="list-style-type: none"> <li>Implementing an Immediate response.</li> <li>No further action.</li> <li>Proceeding with an RI.</li> </ul>	<u>Depositional Soils</u> TCL-VOCs TCL-SVOCs TAL-Metals	Definitive data in CESAS Level B data packages	1 direct-push

ADEM - Alabama Department of Environmental Management.  
ASTM - American Society for Testing and Materials.  
CESAS - Corps of Engineers South Atlantic Savannah.  
DOD - U.S. Department of Defense.  
EPA - U.S. Environmental Protection Agency.  
PSSC - Potential site-specific chemical.  
QC - Quality control.

SVOC - Semivolatile organic compound.  
TAL - Target analyte list.  
TCL - Target compound list.  
USACE - U.S. Army Corps of Engineers.  
VOC - Volatile organic compound.

### **3.3 Conceptual Site Exposure Model**

The conceptual site exposure model (CSEM) provides the basis for identifying and evaluating the potential risks to human health in the risk assessment. The CSEM includes the receptors appropriate to all plausible scenarios, and the potential exposure pathways. Graphically presenting all possible pathways by which a potential receptor may be exposed, including all sources, release and transport pathways, and exposure routes, facilitates consistent and comprehensive evaluation of risk to human health, and helps to ensure that potential pathways are not overlooked. The elements necessary to construct a complete exposure pathway and develop the CSEM include:

- Source (i.e., contaminated environmental media)
- Contaminant release mechanisms
- Contaminant transport pathways
- Receptors
- Exposure pathways.

Contaminant release mechanisms and transport pathways are not relevant for direct receptor contact with a contaminated source medium.

Chemicals of potential concern at this site are limited to petroleum products (fog oil). Primary contaminant release was probably to surface soil and, via smoke, to the air. Airborne contaminants from smoke production would have dispersed long ago and are not considered further. Potential contaminant transport pathways were probably limited to infiltration to subsurface soil. It is unlikely that the small amounts of fog oil released would have leached to groundwater, and this transport pathway is not evaluated. Erosion and runoff to the surface water and sediment in the Willis Branch of Choccolocco Creek, located approximately 0.3 miles south of the site, is unlikely to be a significant transport pathway due to the contaminants in question and distance to the creek. Therefore, it is not evaluated. Dust emissions and volatilization to ambient air, although unlikely to produce toxicologically significant airborne concentrations, is a potentially complete transport pathway.

The Former Smoke Area, South Slope of Morgan Mountain is undeveloped and mostly wooded. The area is a habitat for wildlife and could harbor deer, which may be hunted in season. The plausible receptors under current site use are a youthful visitor and a sportsman who hunts deer and consumes the venison. Other potential receptors considered but not included under current site use are:

- Resident: The site is not currently used for residential development.
- Groundskeeper: The site is not actively used and there is no need for workers to maintain the site.
- Construction worker: The site is currently undeveloped and no excavation or building is occurring.

A review of the FTMC comprehensive reuse plan showed no specific information about future site use (FTMC, 1997). The site is bordered on the south by a road, which provides ready access to the site. Although the northern half of the site is fairly steep, the southern half could be developed for commercial (e.g., camping area) or residential use. Therefore, the groundskeeper, resident, recreational site user, construction worker and venison consumption scenarios are selected as plausible receptor scenarios for the future. Source media of interest are limited to surface and subsurface soil.

The contaminant release and transport mechanisms, source and exposure media, receptors, and exposure pathways are summarized in Figure 3-1 and Table 3-1.

Assessment of potential ecological risk associated with sites or parcels (e.g., surface water and sediment sampling, specific ecological assessment methods, etc.) will be addressed in a separate document to be issued as the habitat-specific screening ecological risk assessment work plan.

### ***3.4 Decision-Making Process, Data Uses, and Needs***

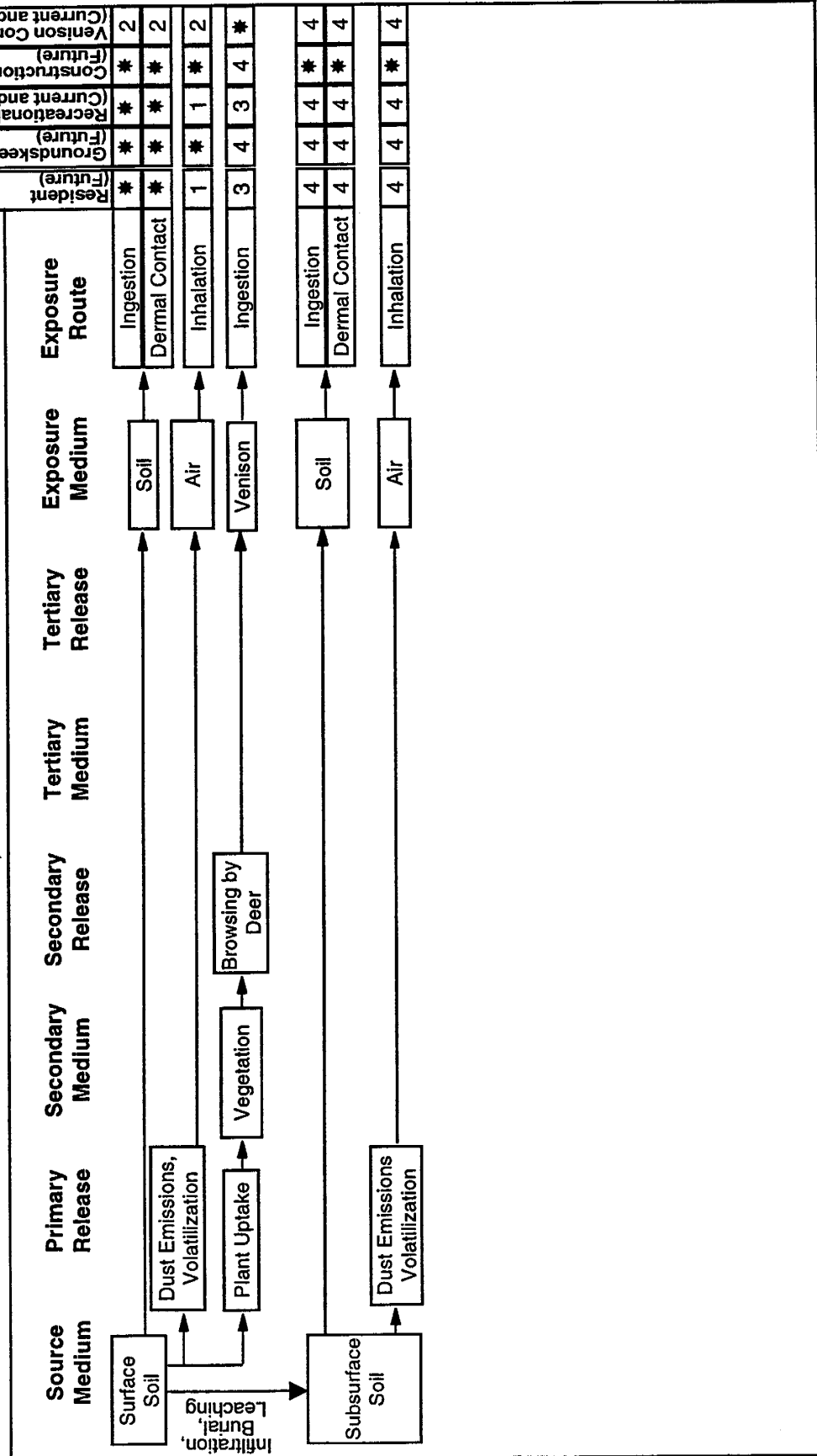
The decision-making process consists of a seven-step process that is presented in detail in Sections 3.2 and 4.3 of the WP and will be followed during the SI at the Former Smoke Area, South Slope of Morgan Mountain. Data uses and needs are summarized in Table 3-1.

#### ***3.4.1 Risk Evaluation***

Confirmation of contamination at the Former Smoke Area, South Slope of Morgan Mountain will be based upon a comparison of detected site contaminants to the site-specific screening levels developed in the WP (IT, 1998b). EPA definitive data with CESAS Level B data packages will be used to achieve detection limits sufficient to determine whether the established guidance criteria are exceeded in site media. Definitive data will be adequate for confirming the presence of site contamination and for supporting additional decision-making steps, such as remedial action and risk assessment, if necessary.

Figure 3-1

# Human Health Conceptual Site Exposure Model for Former Smoke Area, South Slope of Morgan Mountain, Parcel 159(7) Fort McClellan, Alabama



\* = Complete exposure pathway quantified in SSSL development.

1 = Volatilization from undisturbed surface soil deemed insignificant; soil is likely to be paved or vegetated, reducing dust emissions to insignificant levels; inhalation pathway not quantified.

2 = This scenario is created to assess indirect (food chain) exposure to surface soil, surface water and sediment.

3 = Evaluated under venison and fish consumption scenario.

4 = Incomplete exposure pathway.

### ***3.4.2 Data Types and Quality***

To meet the objectives of the SI at the Former Smoke Area, South Slope of Morgan Mountain, it will be necessary to sample and analyze surface and subsurface soils. As described in Chapter 4.0 of this SFSP, quality assurance/quality control (QA/QC) samples will be collected for all sample types. Samples will be analyzed by EPA-approved SW-846 methods, where available; comply with EPA definitive data requirements; and be reported using hard copy data packages. In addition to meeting the quality needs of this SI, data analyzed at this level of quality are appropriate for all phases of site characterization, remedial investigation, and risk assessment.

### ***3.4.3 Precision, Accuracy, and Completeness***

Laboratory requirements of precision, accuracy, and completeness for this SI are provided in Section 9.0 of the QAP.

## **4.0 Field Activities**

---

### **4.1 Utility Clearances**

Prior to performing any intrusive sampling, a utility clearance will be performed at all locations where soil samples will be collected, using the procedure outlined in Section 4.2.6 of the SAP. The site manager will mark the proposed locations with stakes, coordinate with the installation to clear the proposed locations for utilities, and obtain digging permits. Once the locations are cleared, the stakes will be labeled as cleared.

### **4.2 Environmental Sampling**

The environmental sampling program during the SI at the Former Smoke Area, South Slope of Morgan Mountain includes the collection of four surface soil samples, four subsurface soil samples, and one depositional soil sample for chemical analysis. The soil samples will be collected and analyzed to provide data for characterizing the site in order to determine the environmental condition of the site and any further action to be conducted.

#### **4.2.1 Surface Soil Sampling**

Surface soil samples will be collected from four soil borings installed at the Former Smoke Area, South Slope of Morgan Mountain.

##### **4.2.1.1 Sample Locations and Rationale**

Surface soil samples will be collected near the northwest, northeast, southwest, and southeast corners of the Former Smoke Area, South Slope of Morgan Mountain parcel. The surface soil sampling rationale is provided in Table 4-1. Proposed sampling locations are shown on Figure 4-1. Surface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact surface soil sampling locations will be determined in the field by the on-site geologist based on actual field conditions.

##### **4.2.1.2 Sample Collection Procedures**

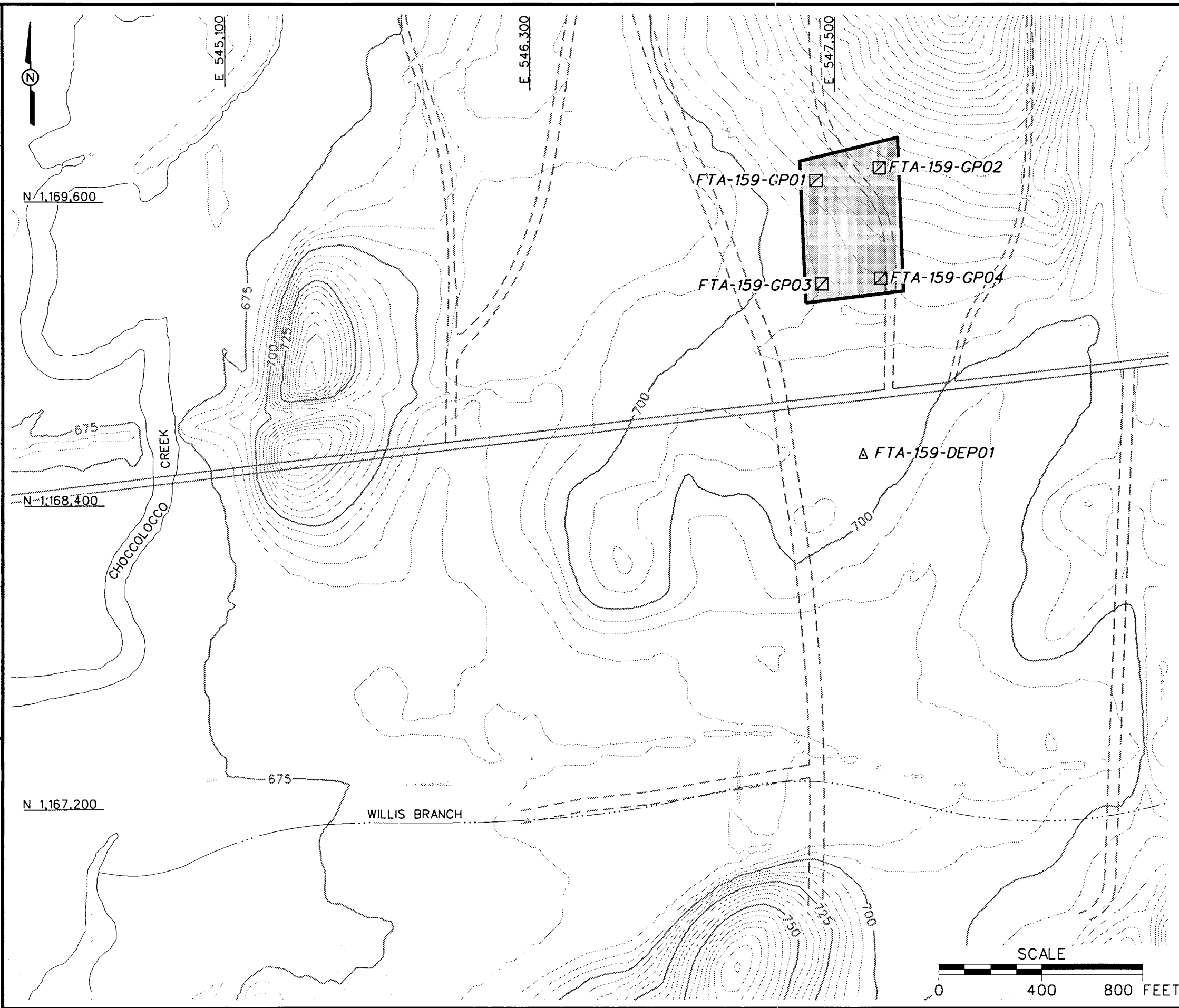
Surface soil samples will be collected from the upper 1 foot of soil by direct-push technology in accordance with the procedures specified in Section 4.7.1.1 of the SAP. Collected soil samples will be screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP. Surface soil samples will be screened with the PID for information only; not to select samples to submit for analysis. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP.

Table 4-1

**Site Sampling Rationale**  
**Former Smoke Area, South Slope of Morgan Mountain, Parcel 159(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Designation	Media Sampled	Sampling Location Rationale
FTA-159-GP01	Surface Soil Subsurface Soil	Direct-push samples will be collected near the northwest corner of the Former Smoke Area, South Slope of Morgan Mountain. Sampling location represents a likely point for the entry, collection, and infiltration of runoff at this site.
FTA-159-GP02	Surface Soil Subsurface Soil	Direct-push samples will be collected near the northeast corner of the Former Smoke Area, South Slope of Morgan Mountain. Sampling location represents the highest elevation within the study parcel.
FTA-159-GP03	Surface Soil Subsurface Soil	Direct-push samples will be collected near the southwest corner of the Former Smoke Area, South Slope of Morgan Mountain. Sampling location is one of the lowest elevations within the study parcel and represents a likely point for deposition.
FTA-159-GP04	Surface Soil Subsurface Soil	Direct-push samples will be collected near the southeast corner of the Former Smoke Area, South Slope of Morgan Mountain. Sampling location is the lowest elevation within the study parcel and represents a likely point for deposition of contaminant.
FTA-159-DEP01	Depositional Soil	Sample will be retrieved from a low-lying or level elevation area south of the parcel. Sampling location represents the most likely area for deposition of parcel soil carried offsite by surface run-off. The sample location selected will represent a potential deposition sink for PSSC from the site.

db:ling c:\N\ds\gvl\774645es.082 23 OCT 98 09:29:08  
STARTING DATE: 05/29/98 DATE LAST R. DRAFT. CHCK. BY: INITIATOR: T. NOLEN DWG. NO.: 4645es.082  
DRAWN BY: D. BILLINGSLEY ENGR. CHCK. BY: A. MAYILA PROJ. MGR.: J. YACOBUB PROJ. NO.: 774645



- LEGEND**
- UNIMPROVED ROADS AND PARKING
  - BUILDING
  - TOPOGRAPHIC CONTOURS
  - PARCEL BOUNDARY
  - SURFACE DRAINAGE / CREEK
  - PROPOSED SURFACE AND SUBSURFACE SOIL SAMPLE
  - PROPOSED DEPOSITIONAL SOIL SAMPLE

**FIGURE 4-1**  
**PROPOSED SAMPLE LOCATIONS**  
**FORMER SMOKE AREA SOUTH**  
**SLOPE MORGAN MOUNTAIN**  
**PARCEL 159(7)**

U. S. ARMY CORPS OF ENGINEERS  
MOBILE DISTRICT  
FORT McCLELLAN  
CALHOUN COUNTY, ALABAMA  
Contract No. DACA21-96-D-0018

**IT** INTERNATIONAL  
TECHNOLOGY  
CORPORATION

Table 4-2

**Surface and Subsurface Soil Sample Designations and QA/QC Sample Quantities**  
**Former Smoke Area South Slope of Morgan Mountain, Parcel 159(7)**  
**Fort McClellan, Calhoun County, Alabama**

Sample Location	Sample Designation	Sample Depth (ft)	QA/QC Samples			Analytical Suite
			Field Duplicates	Field Splits	MS/MSD	
FTA-159-GP01	FTA-159-GP01-SS-FA0001-REG	0-1.0 <sup>a</sup>				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-159-GP01-DS-FA0002-REG					
FTA-159-GP02	FTA-159-GP02-SS-FA0003-REG	0-1.0 <sup>a</sup>			FTA-159-GP02-SS-FA0003-MS	TCL VOCs, TCL SVOCs, TAL Metals
	FTA-159-GP02-DS-FA0004-REG				FTA-159-GP02-SS-FA0003-MSD	
FTA-159-GP03	FTA-159-GP03-SS-FA0005-REG	0-1.0 <sup>a</sup>	FTA-159-GP03-SS-FA0006-FD	FTA-159-GP03-SS-FA0007-FS		TCL VOCs, TCL SVOCs, TAL Metals
	FTA-159-GP03-DS-FA0008-REG					
FTA-159-GP04	FTA-159-GP04-SS-FA0009-REG	0-1.0 <sup>a</sup>				TCL VOCs, TCL SVOCs, TAL Metals
	FTA-159-GP04-DS-FA0010-REG					
FTA-159-DEP01	FTA-159-DEP01-FA0011-REG	0-1.0 <sup>a</sup>				TCL VOCs, TCL SVOCs, TAL Metals

<sup>a</sup> Actual sample depth selected for analysis will be at the discretion of the on-site geologist and will be based on field observation.

QA/QC - Quality assurance/quality control  
MS/MSD - Matrix spike/matrix spike duplicate  
TCL - Target compound list  
VOC - Volatile organic compound  
SVOC - Semivolatile organic compound  
TAL - Target analyte list

Sample documentation and chain of custody (COC) will be recorded as specified in Section 4.13 of the SAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### **4.2.2 Subsurface Soil Sampling**

Subsurface soil samples will be collected from the four soil borings installed near the northwest, northeast, southwest, and southeast corners of the parcel, as described in Section 4.2.1.1.

##### **4.2.2.1 Sample Locations and Rationale**

Subsurface soil samples will be collected from the soil borings proposed on Figure 4-1. The subsurface soil sampling rationale is presented in Table 4-1. Subsurface soil sample designations, depths, and required QA/QC sample quantities are listed in Table 4-2. The exact soil boring sampling locations will be determined in the field by the on-site geologist based on actual field observations.

##### **4.2.2.2 Sample Collection Procedures**

Subsurface soil samples will be collected from soil borings at a depth greater than 1-foot bgs in the unsaturated zone. The soil borings will be advanced and soils samples collected using the direct-push sampling procedures specified in Section 4.7.1.1 of the SAP.

Soil samples will be collected continuously for the first 12 feet or until either groundwater or refusal is reached. A detailed lithological log will be recorded by the on-site geologist for each borehole. At least one subsurface sample from each borehole will be selected for analyses. The collected subsurface soil samples will be field-screened using a photoionization detector (PID) in accordance with Section 4.15 of the SAP to measure samples exhibiting elevated readings above background (readings in ambient air). Typically, the subsurface soil sample showing the highest readings above background using the PID will be sampled and submitted to the laboratory for analysis. If none of the sample intervals collected indicate elevated readings on the PID, the deepest interval collected will be submitted for laboratory analyses. Subsurface soil samples will be selected for analyses from any depth interval if the on-site geologist suspects PSSC at the interval. Site conditions such as lithology may also determine the actual sample depth interval submitted for analyses. More than one subsurface soil sample will be collected if field measurements and observations indicate a possible layer of PSSC and/or additional sample data would provide insight to the existence of any PSSC.

Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in

this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5 of this SFSP.

#### ***4.2.3 Depositional Soil Sampling***

One depositional soil sample will be collected at the Former Smoke Area, South Slope of Morgan Mountain site.

##### ***4.2.3.1 Sample Locations and Rationale***

The depositional soil sample will be collected in a low-lying or level elevation area south of the parcel. The sampling rationale is listed in Table 4-1 and the proposed sampling location is shown on Figure 4-1. The depositional soil sample designation, depth, and required QA/QC sample quantities are listed in Table 4-2. The actual depositional soil sample point will be at the discretion of the ecological sampler, based on the physical characteristics of the drainage area and actual field observations.

##### ***4.2.3.2 Sample Collection Procedures***

Depositional soil sample collection will be conducted in accordance with the procedures for surface soil sample collection specified in Section 4.9.1.1 of the SAP. Sample documentation and COC will be recorded as specified in Section 4.13 of the SAP. Sample containers, sample volumes, preservatives and holding times for the analyses required in this SFSP are listed in Chapter 5.0, Table 5-1 of the QAP. The samples will be analyzed for the parameters listed in Section 4.5.

#### ***4.3 Decontamination Requirements***

Decontamination will be performed on sampling and nonsampling equipment to prevent cross-contamination between sampling locations. Decontamination of sampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.1 of the SAP. Decontamination of nonsampling equipment will be performed in accordance with the requirements presented in Section 4.10.1.2 of the SAP.

#### ***4.4 Surveying of Sample Locations***

Sampling locations will be marked with pin flags, stakes, and/or flagging, and will be surveyed using either global positioning system (GPS) or conventional civil survey techniques, as necessary to obtain the required level of accuracy. Horizontal coordinates will be referenced to the Alabama State Plane Coordinate System, 1983 North American Datum (NAD83). Elevations

will be referenced to the National Geodetic Vertical Datum of 1929 or the North American Vertical Datum of 1988 (soon to be established on site).

Horizontal coordinates for soil sample locations will be recorded using a GPS to provide accuracy within 1 meter.

Procedures to be used for GPS surveying are described in Section 4.3 of the SAP. Conventional land survey requirements are presented in Section 4.19 of the SAP.

#### ***4.5 Analytical Program***

Samples collected at locations specified in Chapter 4.0 of this SFSP will be analyzed for the specific suites of chemicals and elements based on the history of site usage, as well as the EPA, ADEM, FTMC, and USACE requirements. Target analyses for samples collected from the Former Smoke Area, South Slope of Morgan Mountain site consist of the following list of analytical suites:

- Target compound list (TCL) volatile organic compounds - Method 5035/8260B
- TCL semivolatile organic compounds - Method 8270C
- Target analyte list (TAL) metals – Method 6010B/7000.

The samples will be analyzed using EPA SW-846 methods, including Update III Methods where applicable, as presented in Table 4-3 in this SFSP and Table 6-1 in the QAP. Data will be reported and evaluated in accordance with CESAS Level B criteria (USACE, 1994) and the stipulated requirements for the generation of definitive data (Section 3.1.2 of the QAP). Chemical data will be reported via hard copy data packages by the laboratory using CLP-like forms. These packages will be validated in accordance with EPA National Functional Guidelines by Level III criteria.

#### ***4.6 Sample Preservation, Packaging, and Shipping***

Sample preservation, packaging, and shipping will follow the procedures as specified in Section 4.13.2 of the SAP. Completed analysis request/COC records will be secured and included with each shipment of coolers to the following subcontract laboratory:

Sample Receiving  
Quanterra Environmental Services  
5815 Middlebrook Pike  
Knoxville, Tennessee 37921  
Telephone: (423) 588-6401.

Table 4-3

**Analytical Samples**  
**Former Smoke Area, South Slope of Morgan Mountain, Parcel 159(7)**  
**Fort McClellan, Calhoun County, Alabama**

Parameters	Analysis Method	Sample Matrix	TAT Needed	Field Samples <sup>a</sup>			QA/QC Samples <sup>b</sup>					Quanterra Total No. Analysis	QA Lab Total No. Analysis
				No. of Sample Points	No. of Events	No. of Field Samples	Field Dups (10%)	Spills w/ QA Lab (5%)	MS/MSD (5%)	Trip Blank (1/ship)	Eq. Rinse (1/wk/matrix)		
TCL VOCs	8260B	soil	normal	9	1	9	3	3	3		1	19	3
TCL SVOCs	8270C	soil	normal	9	1	9	1	1	1		1	13	1
TAL Metals	6010/7000	soil	normal	9	1	9	1	1	1		1	13	1
Former Smoke Area, South Slope of Morgan Mountain Subtotal:							5	5	5	0	3	45	5

<sup>a</sup>For TCL VOC analyses in soil, the total number of samples is calculated based on the SW-846 Update III requirements for collection and individual analysis of three aliquots of soil for each sample collected. QA/QC sample totals also reflect this requirement. The incremental cost of \$8 per sample for the Encore soil sampler is added to the base analytical cost of \$143 per volatile sample for a total analytical cost of \$151 per sample.

<sup>b</sup>Field duplicate, QA split, and MS/MSD samples were calculated as a percentage of the field samples collected per site and were rounded up to the nearest whole number. Trip blank samples will be collected in association with water matrix samples for VOC analysis only. Assumed four field samples per day to estimate trip blanks. Equipment blanks will be collected once per event whenever sampling equipment is field decontaminated and re-used. They will be repeated weekly for sampling events that are anticipated to last more than 1 week. Assumed 20 field samples will be collected per week to estimate number of equipment blanks.

<sup>c</sup>Analytical unit costs are based on reporting a Level III hard copy data package and IT format electronic data deliverable. Rush turnaround charges were not applied.

<sup>d</sup>Analytical totals are calculated by multiplying the unit cost by the sum of the field samples, field duplicates, trip blanks, and equipment rinse blanks. No costs were added for QA splits and MS/MSDs.

## Ship samples to:

Quanterra Environmental Services  
 5815 Middlebrook Pike  
 Knoxville, Tennessee 37921  
 Attn: John Reynolds  
 Tel: 423-588-6401  
 Fax: 423-584-4315

## USACE Laboratory split samples

are shipped to:

USACE South Atlantic Division Laboratory  
 Attn: Sample Receiving  
 611 South Cobb Drive  
 Marietta, Georgia 30060-3112  
 Tel: 770-919-5270

QA/QC - Quality assurance/quality control.

MS/MSD - Matrix spike/matrix spike duplicate.

VOC - Volatile organic compound.

SVOC - Semivolatile organic compound.

TAL - Target analyte list.

TCL - Target compound list.

Split samples collected for the USACE Laboratory will be shipped to the following address:

USACE South Atlantic Division Laboratory  
Attn: Sample Receiving  
611 South Cobb Drive  
Marietta, Georgia 30060  
Telephone: (770) 919-5270

#### ***4.7 Investigation-Derived Waste Management***

Management and disposal of the investigation-derived wastes (IDW) will follow procedures and requirements as described in Appendix D of the SAP. The IDW expected to be generated at the Former Smoke Area, South Slope of Morgan Mountain site will include decontamination fluids and disposable personal protective equipment. The IDW will be staged inside the fenced area surrounding Buildings 335 and 336 while awaiting final disposal.

#### ***4.8 Site-Specific Safety and Health***

Safety and health requirements for this SI are provided in the SSHP attachment for Former Smoke Area, South Slope of Morgan Mountain, Parcel 159(7). The SSHP attachment will be used in conjunction with the SHP.

## ***5.0 Project Schedule***

---

The project schedule for the SI activities will be provided by the IT project manager to the BRAC Closure Team on a monthly basis.

## **6.0 References**

---

Environmental Science and Engineering Inc. (ESE), 1998, *Final Environmental Baseline Survey, Fort McClellan, Alabama*, prepared for U.S. Army Environmental Center, Aberdeen Proving Ground, Maryland, January.

Fort McClellan (FTMC), 1997, *Fort McClellan Comprehensive Reuse Plan*, prepared under contract to the Calhoun County Commission, November.

IT Corporation (IT), 1998a, *Final Installation-Wide Sampling and Analysis Plan, Fort McClellan, Calhoun County, Alabama*, August.

IT Corporation (IT), 1998b, *Final Installation-Wide Work Plan, Fort McClellan, Calhoun County, Alabama*, August.

U.S. Army Corps of Engineers (USACE), 1998, *Statement of Work for Task Order CK005, Site Investigations, Fort McClellan, Alabama, Scope of Work*, January.

U.S. Army Corps of Engineers (USACE), 1994, *Requirements for the Preparation of Sampling and Analysis Plans*, Engineer Manual EM 200-1-3, September 1.

U.S. Department of Agriculture, 1961, *Soil Survey, Calhoun County, Alabama*, Soil Conservation Service, Series 1958, No. 9, September.

U.S. Environmental Protection Agency (EPA), 1993, *Data Quality Objectives Process for Superfund, Interim Final Guidance*, EPA 540-R-93-071, September.